

§ 178.352-2 Rated capacity.

(a) Rated capacity as marked (see § 178.352-6). Not less than 55 gallons nor more than 110 gallons for the outer steel drum. Not more than 17.74 L for the inner vessel.

(b) The authorized maximum gross weight of the package is 160 kg (350 pounds) for sizes not over 210 L (55 gallons) or 220 kg (480 pounds) for sizes over 210 L (55 gallons) but not over 420 L (110 gallons).

[Amdt. 178-1, 33 FR 14934, Oct. 4, 1968, as amended by Amdt. 178-35, 39 FR 45246, Dec. 31, 1974. Redesignated by Amdt. 178-97, 55 FR 52716, Dec. 21, 1990, and amended by Amdt. 178-99, 58 FR 51534, Oct. 1, 1993; 66 FR 45382, 45387, 45389, Aug. 28, 2001]

§ 178.352-3 General construction requirements.

(a) The outer shell must be of straight sided steel, with welded body seams and at least 18-gauge body and bottom head sheets, and 14-gauge removable head sheets (unless there are one or more corrugations in the cover near the periphery, in which case 16-gauge is authorized). The shell may be either a single sheet of steel or may be fabricated by welding together two appropriate lengths of 210 L (55-gallon) drums, such as a DOT Specification 6J or 17H, with rolled or swaged in hoops as prescribed for either of those specifications. The head must be convex (crowned), not extending beyond the level of the chime, with a minimum convexity of 1 cm ($\frac{3}{8}$ -inch). The inside diameter of the shell must be at least 57 cm (22.5 inches).

(b) Inner containment vessel must conform to specification 2R (except that cast iron is not authorized), with a maximum usable inside dimension of 13.3 cm (5.25 inches) maximum height of 127 cm (50 inches) (with caps in place) and minimum wall thickness of 6 mm (0.25 inch).

(c) Inner containment vessel must be fixed within the outer shell by one of the following types of centering devices:

(1) At least 8 steel rod spacers, of at least 6 mm (0.25-inch) diameter (for packages of 210 L (55-gallon) capacity) or 1 cm of (0.375-inch) diameter (for packages with greater than 210 L (55-gallon) capacity) cold rolled steel,

welded to the vessel at each end by minimum 5 cm (2-inch) continuous weld. Each rod must be welded to the vessel at radial positions not exceeding 45 degrees as not to interfere with closure of the inner vessel. Each spacer rod must extend at least 5.6 cm (2.25 inches) beyond the inner vessel at each end, then radially to the wall of the outer drum (to provide a springlike snug fit) and along the entire length of the wall of the outer drum. For a packaging of more than 210 L (55-gallon) capacity, each spacer rod must be braced by welding a 6 millimeter (0.25-inch) by 5 cm (2-inch) steel plate to the spacer rod and the pipe with a continuous weld at each joint, the joints being located approximately half way along the length of the drum. For containers manufactured prior to March 31, 1975, this requirement is effective December 31, 1975.

(2) At least three steel "spiders," not more than 24 inches apart, with each spider having at least four legs. Each leg must be constructed of materials having dimensions not less than those listed in this paragraph, welded by continuous weld at each joint to inner and outer steel bands of at least $\frac{1}{4}$ -inch by 1-inch steel. The inner steel band must be welded to the inner vessel by at least six 2-inch welds on both edges of the band. The outer steel band must be welded to the outer drum by at least six 2-inch welds on both edges of the top outer band, such that the inner vessel is at least $2\frac{1}{4}$ inches from the top and bottom of the drum. Authorized construction materials are:

(i) 2.5 cm (1 inch) by 2.5 cm (1 inch) by 6 mm ($\frac{1}{4}$ -inch) steel angle iron.

(ii) 3 cm ($1\frac{1}{4}$ inches) by 3 cm ($1\frac{1}{4}$ inches) by 5 mm ($\frac{3}{16}$ -inch) steel angle iron.

(iii) 2.5 cm (1 inch) schedule 40 steel pipe.

(iv) $1\frac{1}{2}$ -inch diameter solid steel rods, with only two such spiders required instead of three.

(3) There must not be less than 2 spacer mechanisms for a packaging of 210 L (55-gallon) capacity nor less than 3 spacer mechanisms for a packaging greater than 210 L (55-gallon) capacity. Each spacer mechanism must consist of not less than 6 steel angles, pipe, or rod radial supports of at least 2.7

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square cm (0.42 square inch) cross-section. Each radial support must be welded at one end to the containment vessel by a continuous weld or to an inner steel band of at least 6 mm (¼-inch) by 2.5 cm (1 inch) by a continuous weld at radial positions not exceeding 60 degrees from the center of the package. The inner band, when used, must be welded to the inner containment vessel by at least 6 equally spaced 5 cm (2-inch) welds on each edge of the band. The opposite end of the radial support must be welded by a continuous weld to an outer steel band of at least 6 mm (¼-inch) by 2.5 cm (1 inch). The outer steel band must be welded to the outer shell by at least 6 equally spaced welds on each edge of the top band, such that the inner vessel is fixed at least 5.7 cm (2.25 inches) from the top and bottom of the drum. The spacer mechanism must be welded as specified near each end of the containment vessel so as not to interfere with the vessel closure. For a packaging greater than 210 L (55-gallon) capacity, the additional spacer mechanism must be located at approximately midpoint along the length of the inner vessel.

(d) The void between the inner containment vessel and the outer shell must be completely filled with bagged or tamped vermiculite (expanded mica), with a density of at least 0.072 g/cc (4.5 pounds per cubic foot). Loose, untamped vermiculite is not authorized.

[Amdt. 178-1, 33 FR 14934, Oct. 4, 1968, as amended by Amdt. 178-35, 39 FR 45246, Dec. 31, 1974; 40 FR 2435, Jan. 13, 1975; 40 FR 44327, Sept. 26, 1975. Redesignated by Amdt. 178-97, 55 FR 52716, Dec. 21, 1990; 66 FR 45387, 45389, Aug. 28, 2001]

§ 178.352-4 Welding.

Welding must be of material having a melting point in excess of 800 °C (1475 °F) (except that for packages constructed prior to March 31, 1975, this temperature may be 540 °C (1000 °F)), with a joint efficiency of at least 0.85. This requirement applies to welding

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used in adding spacer rods to comply with § 178.352-3(c)(1).

[Amdt. 178-35, 39 FR 45246, Dec. 31, 1974. Redesignated by Amdt. 178-97, 55 FR 52716, Dec. 21, 1990, as amended at 63 FR 37462, July 10, 1998]

§ 178.352-5 Closure.

(a) The outer drum closure must be at least a 12-gauge bolted ring with drop forged lugs, one of which is threaded, and having at least a 1.6 centimeter (⅝-inch) diameter steel bolt and a lock nut, or equivalent device.

(b) The closure device must have a means for the attachment of a tamper-proof lock wire and seal, or equivalent.

[Amdt. 178-1, 33 FR 14935, Oct. 4, 1968, as amended by Amdt. 178-35, 39 FR 45246, Dec. 31, 1974. Redesignated by Amdt. 178-97, 55 FR 52716, Dec. 21, 1990]

§ 178.352-6 Markings.

(a) Markings on each container, by die stamping on a metal plate attached to the outside of the outer container by spot welding, or other equally efficient method, in letters and figures of at least one-fourth inch in height, as follows:

(1) "DOT-6L".

(2) "FISSILE RADIOACTIVE MATERIAL."

(3) Name or symbol of person making the marks specified in paragraph (a) (1) of this section. Symbol, if used, must be registered with the Associate Administrator.

(4) Gauge of metal of the outer steel drum in the thinnest part, rated capacity of the outer steel drum in gallons, and the year of manufacture of the assembled package (e.g., 18-110-68). When the gauge of the metal in the drum wall differs from that in the head, both must be indicated with a slanting line between, and with the gauge of the body indicated first (e.g., 18/16-110-68 for 18-gauge body and 16-gauge head).

(b) [Reserved]

[Order 70, 31 FR 6496, Apr. 29, 1966. Redesignated at 32 FR 5606, Apr. 5, 1967. Redesignated by Amdt. 178-97, 55 FR 52716, Dec. 21, 1990; 66 FR 45386, Aug. 28, 2001]